

with a tubercle; a few indistinct spots and short bars on temples; a streak below eye; and a large indistinct spot before eye. On each side of occipito-scapular white lines (but not in contact with them) a broad purplish-brown line; indistinct spots or short bars of same colour on temples, snout and lips. Edge of eyelid yellow. Undersurface white.

Variation—Apart from its small size, the paratype differs from the holotype mainly in coloration. Its white occipito-scapular lines are continuous and much broader; the intervening purplish-brown bands are darker and clearer-cut; and the white dorsal spots tend to align longitudinally. Unlike the holotype, the paratype has a few small tubercles scattered among the granules of the neck, and the ring of scales surrounding dorsal tubercles are considerably larger than the ordinary dorsal scales. The paratype has relatively a much smaller ear aperture than the holotype, and its mental is wider (not narrower) than the rostral and terminates in a lip-like projection.

Comparisons—In the colour pattern of its neck and shoulders and in the structure of its tubercles, *stellatus* is most like *levis* and *vertebralis* but differs from both of those species in having (1) a spotted back; (2) shorter head (33.40 per cent of body-length, against 34.48 in *levis* and 35.46 in *vertebralis*); (3) shorter tail (39.49 per cent of body-length, against 46.71 in *levis* and 47.63 in *vertebralis*); (4) fewer caudal annuli (13, against 15.22 in *levis* and *vertebralis*); (5) few or no tubercles on neck and shoulders; (6) fewer and larger tubercles on back; and (7) fewer tubercles on tail (6.8 on proximal annuli, against 10.12 in *levis* and 8.10 in *vertebralis*).

N. stellatus agrees with *vertebralis* and differs from *levis* in its relatively narrow tail and moderately high and acute scales surrounding the conical scales of white dorsal tubercles. It agrees with *levis* and differs from *vertebralis* in having the caudal tubercles not well-aligned longitudinally and the mental not more than 2½ times as wide as deep.

REFERENCE

- STORR, G. M., 1963. The gekkonid genus *Nephrurus* in Western Australia, including a new species and three new subspecies. *J. Roy. Soc. W. Aust.*, 46: 85-90.

AN ANNOTATED LIST OF ANGIOSPERMS OF LAKESIDE STATION, CUE, WESTERN AUSTRALIA

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INTRODUCTION

In October and December of 1965 the author accompanied Mr E. O. Hellmuth on a series of research trips to Messrs. Clarkson's Station, Lakeside, Cue, Western Australia, and during these visits a collection of plants from the surrounding area was made. Further collections were made in 1966 by Mr. Hellmuth and Mr. B. M. Allender, but these revealed no additional species.

The main collection area was an experimental site approximately 27 miles from Cue townsite and 5 miles from Lakeside Homestead on the track leading from Cue to the homestead. Specimens from nearby Lake Austin are not included in this list, although some plants listed from the experimental area do occur on and near Lake Austin, e.g. *Grevillea sarissa* S. Moore.

The altitude of the Cue area varies from 900-1,500 feet, with laterite-capped mesas (rimmed by "breakaways") which extend approximately thirty feet above the surrounding plains (Johnson, 1950). The surface of both the high and low level plains is covered by a red sandy loam which generally overlays a cement-like sheet of laterite varying in thickness from a few inches to six or more feet, while a kaolinised granite is exposed in the cliff faces below the protective laterite capping. This area has suffered from severe erosion by wind, rain and exfoliation (Woodward, 1914). Caves at the base of the breakaways caused by the combined effects of wind and rain erosion are common. The walls of these caves are adorned with aboriginal paintings.

CLIMATIC DATA

Rainfall

The area around Lakeside Station belongs to the arid climatic type (Gentilli, 1963). It is shown on the rainfall maps as coming within the 8 inch isohyet but the yearly rainfall may vary between 3.60 inches and 15.16 inches as may be seen from Table 1. This lists the records for the last 6 years from the rain gauge at the Station.

TABLE 1—RAINFALL AT LAKESIDE STATION

Year	Rainfall in points
1959	360
1960	1107
1961	848
1962	848
1963	1516
1964	745

Average rainfall, 9.04 inches.

In figure 1 a graph of the average monthly rainfall for the years 1959-1964, is shown. This graph highlights the fact that the rainfall in the area is very erratic. The two climatic influences which operate are: (a) The tropical summer cyclones, and (b) The southern winter rainfall from April to August.

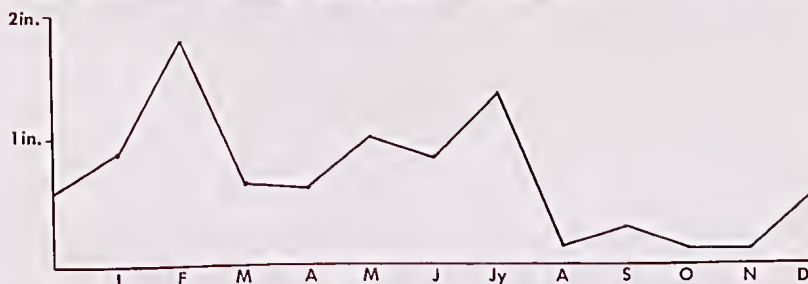


Fig. 1—Average monthly rainfall at Lakeside Station, 1959-1964.

Temperature

Monthly temperatures for Lakeside were not available and the following analysis is based on the mean temperatures for the Cue area as supplied by the Bureau of Meteorology (1965). These monthly temperatures, averaged over 30 years, show that the hottest months are those of November, December, January and February with mean temperatures all over 90 deg.F., with January

recording a mean maximum of 99.3 deg.F., this being the highest, The mean minimum temperatures, again averaged over 30 years, show that the coolest months are those of June, July and August with July having a mean minimum temperature of 44.3 deg.F., this being the lowest.

VEGETATION

This area is in the true "Mulga" zone as defined by Gardner (1942), the predominating species being *Acacia* and *Eremophila*, e.g. *Acacia aneura* F. Muell. and *Eremophila leucophylla* Benth.

The vegetation of the breakaways differs from that of the lower plain, in that it has more species, and some species appear limited to it, e.g. *Calytrix* sp. and *Eriostemon* sp. There is also a tendency for some plants to occur along dried-up watercourses and run-off channels, e.g. *Goodenia* sp., and *Eremophila longifolia* F. Muell. Some species appear to survive in the shade of the breakaways e.g. *Nicotiana cavicola*, N.T. Burbidge, *Sida corrugata* Lindl., *Abutilon oxycarpum* (F. Muell.) Benth., and the common rock fern *Cheilanthes tenuifolia* (Burm. f.) Swartz.

Provisional identifications were made using the standard published Flora keys listed under References, and were then checked at the Western Australian Herbarium. The specimens are permanently housed in the Herbarium of the Botany Department, The University of Western Australia.

The following list could be augmented by several ephemerals and grasses of which only dead and indeterminate plants were available at the time the author visited Cue.

ANGIOSPERMAE

Poaceae (= Gramineae)

Neurachne mitchelliana Nees. Tussocky grass. Common on red sand.

Liliaceae

Thysanotus patersonii R.Br. "Twining Fringe Lily." Twining herb up to 1 metre. Flowers mauve with fringed inner perianth. Common on breakaways and plain.

Orchidaceae

Pterostylis nana R.Br. "Dwarf Greenhood." Greenhood orchid up to 12 cm. with basal rosette of leaves. Rare in this area, only one specimen found.

Proteaceae

Persoonia saundersiana Kipp. Tree up to 3 metres with green drooping foliage. Flowers yellow. Restricted to breakaways.

Petrophile (= *Petrophila*) *conifera* Meissn. Shrub up to 1 metre. Leaves rigid and terete. Flowers yellow-orange. Restricted to breakaways.

Grevillea deflexa F. Muell. Prostrate shrub. Leaves linear with pungent points. Flowers deep red. Occurs on weathered granite.

G. excelsior Diels. "Flame Grevillea". Shrub up to 5 metres. Flowers orange in long spikes. Common on plains.

G. obliquistigma C.A. Gardn. Shrub up to 5 metres. Leaves linear and terete. Flowers white in cylindrical spikes. Common.

G. sarissa S. Moore. Dense shrub up to 1 metre. Leaves rigid and terete. Flowers red. Occurs toward Lake Austin.

Santalaceae

Santalum acuminatum (R.Br.) DC. "Sweet Quandong". Tree up to 7 metres. Leaves dark green. Fruit large and deep red. Endocarp (stone) deeply pitted.

S. murrayanum (L. T. Mitch.) C. A. Gardn. 'Bitter Quandong'. Tree up to 5 metres. Fruit red. Endocarp (stone) minutely pitted.

Loranthaceae

Lysiana casuarinae (Miq.) Van Tiegh. Semi-parasite on trees and shrubs. Leaves linear. Flowers red-yellow. Fruit scarlet. Common.

Amyema nestor (S. Moore) Danser. Semi-parasite on trees and shrubs. Leaves grey, woolly. Flowers red inside, grey tomentose outside. Berries white, tomentose.

Chenopodiaceae

Rhagodia baccata (Labill.) Moq. "Sea Berry Saltbush". Shrub up to 2 metres. Flowers white, inconspicuous. Berries red in clusters. Occurs frequently on plains in shade of *Acacia* sp.

Kochia tomentosa F. Muell. "Silky Bluebush". Erect shrub up to ½ metre. Fruits shiny brown. Common.

Threlkeldia diffusa R.Br. "Wallaby Saltbush". Shrub up to 1 metre. Foliage grey-white, with red berries. Common.

Amarantaceae

Ptilotus arthrolasius F. Muell. Tufted herb up to 30 cm. Flowers red. Common.

Ptilotus sp. Tufted herb up to 30 cm. Flowers red. Leaves dying off at base. Common.

Portulacaceae

Calandrinia polyandra (Hook.) Benth. "Parakeelya". Herb up to 15 cm. Leaves extremely succulent. Inflorescences tall. Flowers pink. Common in shade.

Mimosaceae

Acacia aneura F. Muell. ex Benth. "Mulga". Tree up to 3 metres. Phyllodes greyish-green. Flowers yellow in cylindrical heads. Common.

A. brachystachya Benth. Tree up to 4 metres. Phyllodes greyish-green, linear, becoming almost terete. Flowers yellow in cylindrical heads. Common.

A. craspedocarya F. Muell. Tree up to 4 metres. Phyllodes greyish-green, minutely veined. Flowers yellow in cylindrical heads. Common.

A. grasbyi Maiden. Tree up to 2 metres. Phyllodes terete with resinous appearance. Bark, brown and flaky. Flowers yellow in cylindrical heads. Common.

A. tetragonophylla F. Muell. "Curara". Tree up to 5 metres. Phyllodes terete with pungent points. Flowers yellow in globular heads. Common.

A. quadrimarginea F. Muell. Tree up to 4 metres. Phyllodes linear to linear lanceolate with fine striations and hooked towards the apex. Common near breakaways and outcrops.

A. sp. "Gidgee". Tree up to 3 metres. Phyllodes large with a prominent centre vein. Flowers yellow in globular heads. Common. This specimen could not be referred to any known species (Coll. No. 74A).

Caesalpinaceae

Cassia nemophila A. Cunn. "Desert Cassia." Tree up to two metres. Leaves dark green. Flowers bright yellow. Common.

C. sturtii R. Br. "Dense Cassia". Shrub up to 1 metre. Flowers yellow. Common.

Fabaceae (= Papilionaceae)

Jacksonia nematoclada F. Muell. Branched shrub up to 2 metres. Flowers orange. Young pod silky hairy. Scattered on breakaways only.

Swainsona paradoxa W. V. Fitzg. Prostrate herb with erect flowering branches. Flowers reddish purple. Common towards Lake Austin.

Rutaceae

Eriostemon sp. Shrub up to 1 metre. Leaves reduced. Flowers pale pink to white. Found only on the breakaways. This specimen could not be referred to any known species (Coll. No. 39A).

Sapindaceae

Dodonaea laraeoides Turcz. Viscous shrub up to 1 metre. Fruits red to purple. Occurs on breakaways.

Malvaceae

Abutilon oxycarpum (F. Muell.) F. Muell. ex Benth. Shrub up to 1 metre. Flowers orange. Restricted to breakaways.

Sida virgata Hook. Erect slender shrub up to 1 metre. Flowers yellow to orange. In shelter of rocks on breakaways.

S. corrugata Lindl. "Dwarf Sida". Prostrate to erect shrub up to 1 metre. Stems and leaves covered in brown tomentum. Flowers yellow. Common on breakaways.

Frankeniaceae

Frankenia pauciflora DC. Prostrate herb. Flowers pink. Common on sand.

Myrtaceae

Wehlia thryptomenoides F. Muell. Bushy shrub up to 1 metre. Flowers purple to red. Occurs on breakaways.

Calytrix sp. Dense shrub up to 1 metre. Leaves much reduced. Flowers yellow. Remains of old bracteoles attached to stems. Restricted to breakaways. This specimen could not be referred to any known species (Coll. No. 58A).

C. sp. Dense shrub up to 1 metre. Leaves much reduced. Flowers white. Restricted to breakaways. This specimen could not be referred to any known species (Coll. No. 25A).

C. sp. Dense shrub up to 1 metre. Leaves much reduced. Small gnarled bushes. Flowers mauve. Restricted to breakaways. This specimen could not be referred to any known species (Coll. No. 26A).

Micromyrtus flaviflora (F. Muell.) C. A. Gardn. Dense shrub up to 1 metre. Leaves much reduced. Flowers yellow. Restricted to breakaways. Only three shrubs observed.

M. imbricata Benth. Branching shrub up to 2 metres. Leaves small and imbricate. Flowers white to pink. Occurs along dry creek beds.

Thryptomene baeckeacea F. Muell. Shrub up to 2 metres. Leaves small. Flowers white. Common on breakaways.

Darwinia diosmoides (DC.) Benth. Dense shrub up to 10 cm. Leaves greatly reduced. Flowers white, in terminal heads.

Aselepiadaceae

Leichardtia australis R.Br. (= *Marsdenia australis* (R.Br.) Druce.) Twining creeper up to 2 metres. Flowers yellowish-green. Common.

Lamiaceae (= Labiatae)

Hemigenia divaricata C. A. Gardn. Dense shrub up to 1 metre. Flowers purplish-red. Restricted to breakaways.

H. sp. Shrub up to 1 metre. Flowers mauve. Common on breakaways. This specimen resembles *H. tysonii* F. Muell., but is

so variable that more material would have to be examined before a decision could be made (Coll. No. 47A).

H. sp. Shrub up to 1 metre. Leaves linear, long. Flowers white. Occurs alongside dry creek beds. This specimen could not be referred to any known species. (Coll. No. 71A).

Prostanthera microphylla A. Cunn. ex Benth. Dense spiny shrub up to 1 metre. Leaves much reduced. Flowers red. Common on breakaways.

P. wilkieana F. Muell. Dense aromatic shrub up to 1 metre. Flowers white striated with violet. Foliage silver to grey. On pure quartz outcrops only.

P. sp. Dense spiny shrub up to 1 metre. Leaves much reduced. Flowers pale yellow. Common on breakaways. This specimen could not be referred to any known species. (Coll. No. 62A).

Solanaceae

Solanum lasiophyllum Dun. Shrub up to 40 cm. Leaves large and woolly, covered with fine spines. Flowers mauve. Very common. Flowers all year round.

S. orbiculatum Dun. Shrub up to 1 metre. Stems with very pungent spines. Flowers blue to violet. Common.

Nicotiana cavicola N. T. Burbidge. Spindly herb up to 45 cm. Growing in shade of overhanging ledge of breakaway. Flowers white. Not common.

Myoporaceae

Eremophila clarkei F. Muell. Branching shrub up to 2 metres. Flowers mauve to purple. Common.

E. criocalyx F. Muell. Shrub up to 2 metres. Foliage covered in white tomentum. Pedicels woolly. Flowers white. Not common. This specimen is not as woolly as some specimens are reported to be.

E. foliosissima Kraenzlin. Dense shrub up to 1 metre. Leaves long and slender. Flowers pale mauve.

E. fraseri F. Muell. "Turpentine Bush". Shrub up to 1 metre. Leaves dark green, shiny and viscous. Common.

E. granitica S. Moore. Densely branching shrub up to 1 metre. Leaves linear and viscous. Flowers violet to white. Common.

E. latrobei F. Muell. Shrub up to 1 metre. Leaves green with a warty appearance. Flowers red. On breakaways.

E. leucophylla Benth. Dense shrub up to 1 metre. Leaves yellow-green in terminal clusters. Flowers red. Common.

E. longifolia F. Muell. Tree up to 10 metres with drooping foliage. Flowers dull red. Appears to follow dry water courses.

E. miniata C. A. Gardn. Small tree up to 3 metres. Leaves crowded on ends of branches, falling off further back. Flowers yellow-green. Common on red soil.

E. platycalyx F. Muell. Shrub up to 2 metres. Leaves narrow, the apex hooked. Common.

E. sp. Shrub up to 1 metre. Leaves linear and viscous. Flowers pale mauve to white. Common. (Coll. No. L1).

E. sp. Shrub up to 1 metre. Leaves in clusters at the ends of the branches. Flowers red. Occurs on red soil. This specimen closely resembles *Eremophila subfloccosa* Benth., but differs in the flower colour. (Coll. No. G9a).

Rubiaceae

Canthium latifolium F. Muell. ex Benth. "Wild Plum". Tree up to 3 metres. Leaves large with prominent veins. Common.

Lobeliaceae

Lobelia winfridac Diels. Slender herb up to 6 cm. Flowers blue to white. Common.

Goodeniaceae

Velleia rosea S. Moore. Herb up to 30 cm. Flowers pale pink. Very common.

V. pinnatifida Schlecht. Erect herb up to 20 cm. Flowers pale yellow. Common.

Goodenia sp. Spreading herb up to 1 metre. Leaves large and serrated. Flowers large, yellow. Appears to follow dry shaded water courses. Not common. This specimen could not be referred to any known species (Coll. No. 23A).

Brunoniaceae

Brunonia australis Sm. "Native Cornflower". Herb up to 25 cm. Leaves in a basal rosette. Flowers deep blue in compound heads. Abundant.

Stylidiaceae

Stylidium sp. Herb up to 30 cm. with basal tuft of leaves. Flowers ranging from white to deep pink. Common in crevices of breakaways. This specimen could not be referred to any known species (Coll. No. 43A).

Asteraceae (= Compositae)

Bellida graminea A. J. Ewart. Tufted herb up to 10 cm. Flowers yellow, pappus purple. Common.

Waitzia acuminata Steetz. Slender densely branched herb up to 30 cm. Flowers yellow with red tinges. Common.

W. citrina (Benth.) Steetz. Slender densely branched herb up to 30 cm. Flowers pale yellow to orange. Common.

Myriocephalus guerinae F. Muell. Slender herb up to 30 cm. Flowers bright yellow in compound heads. Common.

Gnephosis eriocephala (A. Gray) Benth. Slender spreading herb. Flowers yellow. Common.

G. skirrophora (Sond. and F. Muell.) Benth. Slender herb, up to 10 cm. Flowers yellow. Common.

Cephalopterum drummondii A. Gray. Slender herb up to 30 cm. Flowers white. Abundant.

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REFERENCES

- Australian Bureau of Meteorology, 1965. *Climatic Averages Australia*. Melbourne.
- Beard, J. S. *Descriptive Catalogue of West Australian Plants*. Surrey Beatty and Sons; N.S.W.
- Bentham, G. 1863-1878. *Flora Australiensis*. Vol. 1-7. Reeve: London.
- Blackall, W. E. 1954. Edit. B. J. Grieve. *How to Know Western Australian Wildflowers*. Part I. Univ. W. Aust. Press: Netherlands.

- Blackall, W. E., and B. J. Grieve, 1956 and 1965. *How to Know Western Australian Wildflowers*. Parts 2 and 3. Univ. W. Aust. Press: Nedlands.
- Gardner, C. A. 1930. *Enumeratio Plantarum Australiae Occidentalis*. Govt. Printer: Perth.
- Gardner, C. A. 1942. The vegetation of Western Australia with special reference to the climate and soils. *J. Roy. Soc. W. Aust.*, 28: 11-87.
- Gentili, J. 1963. *Regional and Economic Geography for Secondary Schools*. Carroll's Pty. Ltd.: Perth.
- Johnson, W. 1950. A geological reconnaissance survey of the area including parts of the Yalgoo, Murchison, Peak Hill and Gascoyne Goldfields. *Bull. Geol. Surv. W. Aust.*, No. 106.
- Woodward, H. P. 1914. A geological reconnaissance of a portion of the Murchison Goldfield. *Bull. Geol. Surv. W. Aust.*, No. 57

A COLLIE BIRD LIST

By E. H. SEDGWICK, Harvey

The township of Collie is almost entirely surrounded by Jarrah forest, a fact apparent from aerial photographs in which the township appears as a hole in the forest.

Observations made in and about the town relate to: (a) The urban area—a typical country town of, at the time of my observations, about 9,000 inhabitants. (b) The jarrah forest. (c) A limited belt of small holdings, mainly under pasture, each of about five acres and a few somewhat larger farms. (d) The valleys of the Collie River and its tributaries. (e) The Wellington Dam.

Although the writer was domiciled in the town for six years (1956-1962) opportunities for serious bird observing were limited. However, the paucity of district bird lists relating to the jarrah forest block and the fact that no Collie list has been published appears to justify presenting the list which follows even though it constitutes only an outline of the avifauna.

THE LIST

Emu (*Dromaius novae-hollandiae*).—I noted several sets of tracks near the Wellington Dam, but only once saw an Emu near Collie.

Painted Quail (*Turnix varia*).—Quail were seen on two occasions close to Collie. These were not positively identified, but the forest habitat in each case suggested Painted Quail.

Senegal Turtledove (*Streptopelia senegalensis*).—Though I took up residence in Collie at the beginning of 1956, I did not see a turtledove there until July 10, 1957. Thereafter, until I left Collie at the end of 1962, I recorded single birds from time to time and, on one occasion, two birds.

Common Bronzewing (*Phaps chalcoptera*).—Often encountered in and near the town. The principal concentration in the town is in the railyard.

Crested Pigeon (*Ocyphaps lophotes*).—One reported by a reliable witness as seen on several occasions in the Cheetarra area and a bird seen by another observer in the railyard could have been of this species. I observed none myself, though I made search, but consider the reports—particularly the former—reliable.

Coot (*Fulica atra*).—One bird seen on the Collie River adjacent to the Golf Links on April 6, 1958.